

# CLAIMS

What is claimed is:

1. An isolated polypeptide comprising the amino acid sequence of amino acid residues 230-630 of SEQ ID NO:2.
2. The polypeptide of claim 1, wherein the polypeptide comprises amino acid residues 85-734 of SEQ ID NO:2.
3. The polypeptide of claim 1, wherein the polypeptide comprises amino acid residues 24-886 of SEQ ID NO:2.
4. The polypeptide of claim 1, wherein the polypeptide has the ability to bind to and cleave C1 esterase inhibitor.
5. An isolated polypeptide comprising an amino acid sequence having at least 70% amino acid identity to amino acid residues 24-886 of SEQ ID NO:2, the polypeptide comprising a sequence corresponding with and identical to amino acids 434-444 of SEQ ID NO:2, the polypeptide having the ability to bind to and cleave C1 esterase inhibitor.
6. An isolated polypeptide, the amino acid sequence of which comprises at least 17 consecutive amino acid residues of SEQ ID NO:2.
7. The polypeptide of claim 6, wherein the amino acid sequence comprises at least 25 consecutive amino acid residues of SEQ ID NO:2.
8. The polypeptide of claim 6, wherein the amino acid sequence comprises at least 40 consecutive amino acid residues of SEQ ID NO:2.
9. The polypeptide of claim 6, wherein the amino acid sequence comprises amino acid residues 430-446 of SEQ ID NO:2.

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10. The polypeptide of claim 6, wherein the amino acid sequence comprises amino acid residues 421-446 of SEQ ID NO:2.
11. The polypeptide of claim 6, wherein the amino acid sequence comprises amino acid residues 408-448 of SEQ ID NO:2.
12. A genetic construct comprising a polynucleotide encoding a polypeptide comprising the amino acid sequence of amino acid residues 24-886 of SEQ ID NO:2 or a sequence complementary thereto, the polynucleotide operably linked to an expression control sequence.
13. The genetic construct of claim 7, wherein the polynucleotide comprises bases 207 through 2795 of SEQ ID NO:1.
14. A cell comprising the construct of claim 12.
15. An antibody that binds specifically to an antigenic determinant found on a polypeptide comprising an amino acid sequence comprising SEQ ID NO:2.
16. The antibody of claim 12, wherein the antibody selectively binds to an epitope in the C1 esterase inhibitor binding domain of the polypeptide.
17. A method of preventing or treating colitis or hemolytic uremic syndrome in a subject infected with an enterohemorrhagic pathogen expressing an inhibitor protein comprising an amino acid sequence having substantial sequence identity with amino acid residues 24-886 of SEQ ID NO:2, the inhibitor protein being capable of reducing the activity of C1 esterase inhibitor, comprising the step of:  
administering to the subject an agent selected from the group consisting of an antibody capable of binding to an antigenic determinant of SEQ ID NO:2 and a chelator capable of binding divalent cations in an amount effective to reduce proteolytic inactivation of C1 esterase inhibitor by the inhibitor protein.

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18. A method of preventing colitis or hemolytic uremic syndrome in a subject at risk for infection with an enterohemorrhagic pathogen expressing an inhibitor protein comprising an amino acid sequence substantially homologous to SEQ ID NO:2, the inhibitor protein being capable of reducing the activity of C1 esterase inhibitor, comprising the step of:

administering to the subject an inactivated polypeptide comprising at least one antigenic determinant of a polypeptide comprising SEQ ID NO:2.

19. A method of preventing or treating colitis and/or hemolytic uremic syndrome in a subject infected with an enterohemorrhagic pathogen expressing an inhibitor protein comprising an amino acid sequence substantially homologous to SEQ ID NO:2, the protein inhibitor being capable of reducing the activity of C1 esterase inhibitor, comprising the step of:

administering to the subject C1 esterase inhibitor in an amount effective to reduce activation of at least one proteolytic cascade selected from the group consisting of classical complement cascade, intrinsic coagulation pathway, and kinin-forming system.

20. A method for testing a molecule for the ability to reduce proteolysis of C1 esterase inhibitor by an inhibitor protein comprising an amino acid sequence substantially homologous to amino acid residues 24 to 886 of SEQ ID NO:2, the inhibitor protein being capable of proteolyzing C1 esterase inhibitor, comprising the steps of:

(a) combining the inhibitor protein, test molecule, and C1 esterase inhibitor under suitable conditions for a period of time sufficient to allow inhibitor protein-C1 esterase inhibitor interaction; and

(b) comparing the level of the C1 esterase inhibitor or C1 esterase inhibitor activity in the mixture of step (a) to that of a control lacking the test molecule.

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21. A method of detecting a bacterium comprising a polynucleotide coding sequence encoding a polypeptide, the polypeptide comprising substantial amino acid identity to residues 24-886 of SEQ ID NO:2, comprising the steps of:

- (a) contacting genomic DNA from the organism with at least one primer pair, each primer pair comprises a first primer and a second primer not complementary to the first primer, wherein the first primer hybridizes to a first portion of the polynucleotide coding sequence, and wherein the second primer hybridizes to a polynucleotide complementary to the polynucleotide coding sequence;
- (b) enzymatically extending the hybridized primers of step (a); and
- (c) detecting the extension products of step (b).

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